

CLAIMS FOR US

1. A power tool, comprising:

a tool bit,

an actuating mechanism that drives the tool bit linearly by means of pressure fluctuations so as to cause the tool bit to perform a predetermined operation and

a dynamic vibration reducer having a weight that reciprocates under a biasing force of an elastic element to reduce vibration of the actuating mechanism, the weight being driven by means of pressure fluctuations caused in the actuating mechanism.

2. The power tool as defined in claim 1, wherein the actuating mechanism includes a driving motor, a striker that reciprocates in the axial direction of the tool bit so as to cause the tool bit to linearly move and a crank mechanism that drives the striker by converting a rotating output of the driving motor to linear motion in the axial direction of the hammer bit, the dynamic vibration reducer having a body that houses the weight, wherein the fluctuating pressure caused within the crank chamber by an operation of the crank mechanism is introduced into the body of the dynamic vibration reducer, so that the weight is driven in the direction opposite to the reciprocating direction of the striker.

3. The power tool as defined in claim 1, wherein, under loaded driving conditions, in which a load associated with the predetermined power tool operation is applied to the tool bit, the weight is allowed to be driven by means of fluctuating pressure developed in the actuating mechanism, while, under unloaded driving conditions, in which a load associated with the predetermined power tool operation is not applied to the tool bit, the weight is prevented from being driven by means of fluctuating pressure developed in the actuating mechanism.

4. The power tool as defined in claim 1 wherein, under loaded driving conditions, in which a load associated with the predetermined power tool operation is applied to the tool bit, the weight is allowed to be driven by means of fluctuating pressure developed in the actuating mechanism, while, under unloaded driving conditions, in which a load associated with the predetermined power tool operation is not applied to the tool bit, the weight is prevented from being driven by means of fluctuating pressure developed in the actuating mechanism and,

wherein the dynamic vibration reducer includes a first actuating chamber and a second actuating chamber that are defined on both sides of the weight within the body, and wherein, at least under the loaded driving conditions, the fluctuating pressure developed in the actuating mechanism is introduced into the first actuating chamber, and the second actuating chamber can communicate with the outside.

5. The power tool as defined in claim 1, wherein, under loaded driving conditions, in which a load associated with the predetermined power tool operation is applied to the tool bit, the weight is allowed to be driven by means of fluctuating pressure developed in the actuating mechanism, while, under unloaded driving conditions, in which a load associated with the predetermined power tool operation is not applied to the tool bit, the weight is prevented from being driven by means of fluctuating pressure developed in the actuating mechanism and the fluctuating pressure developed in the actuating mechanism is released to the outside of the power tool under the unloaded driving conditions.

6. The power tool as defined in claim 1, wherein the tool bit comprises a hammer bit that performs a predetermined hammer operation by applying a linear impact force to the work piece, and wherein the actuating mechanism comprises a driving motor, a crank mechanism that is

housed in the crank chamber and converts a rotating output of the driving motor into linear motion, a piston-cylinder mechanism that is driven by the crank mechanism, and a striker that reciprocates in the axial direction of the hammer bit by the action of an air spring which is caused by relative movement of the piston-cylinder mechanism.

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7. The power tool as defined in claim 1, wherein the actuating mechanism includes a piston and a cylinder that slide relative to each other in the axial direction of the tool bit, wherein the tool bit reciprocates in its axial direction by the action of an air spring which is caused by relative movement of the piston and the cylinder, and wherein the weight is disposed along the
10 circumferential surface of the cylinder and can slide in the axial direction of the tool bit.

8. A power tool comprising:

a driving motor,

a tool bit,

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a tool holder that holds the tool bit within the power tool,

a striker that reciprocates in the axial direction of the tool bit so as to cause the tool bit to perform a predetermined operation,

a cylinder that houses the striker such that the striker can slidably reciprocate within the cylinder,

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a crank chamber,

an actuating mechanism that is disposed within the crank chamber and drives the striker by converting a rotating output of the driving motor to linear motion, and

a dynamic vibration reducer that reduces vibration during the operation of the power tool, the dynamic vibration reducer having a weight and a body that houses the weight, wherein
25 the weight can reciprocate under a biasing force of an elastic element and is driven by pressure

fluctuations which are caused within the crank chamber when the actuating mechanism is driven, and wherein the fluctuating pressure caused within the crank chamber by driving of the actuating mechanism is introduced into the body of the dynamic vibration reducer, so that the weight is driven in the direction opposite to the reciprocating direction of the striker,

5 wherein the cylinder can move between a first position near the tool holder and a second position remote from tool holder than the first position, and under loaded driving conditions in which a load associated with the predetermined operation is applied to the tool bit, the cylinder moves to the second position so as to allow the weight to be driven by means of fluctuating pressure within the crank chamber, while, under unloaded driving conditions in which a load
10 associated with the predetermined operation is not applied to the tool bit, the cylinder moves to the first position so as to prevent the weight from being driven by means of fluctuating pressure within the crank chamber.

9. The power tool as defined in claim 8, wherein the cylinder has an air spring chamber that
15 causes the striker to reciprocate by the action of an air spring when the actuating mechanism is driven, and wherein under the loaded driving conditions, the cylinder moves to the second position so as to allow the striker to be driven by the action of the air spring function of the air spring chamber, while, under unloaded driving conditions, the cylinder moves to the first position, so as to prevent the striker from being driven by the action of the air spring function of the air spring
20 chamber.

10. The power tool as defined in claim 9, wherein under the loaded driving conditions, the weight is allowed to be driven by fluctuating pressure within the crank chamber with a time delay after the striker is allowed to be driven by the action of the air spring function of the air spring
25 chamber.

11. The power tool as defined in claim 8, further comprising an air vent that can communicate the crank chamber with the outside, wherein when the cylinder moves to the second position, the air vent is closed so as to allow the weight to be driven, and when the cylinder moves
5 to the first position, the air vent is opened so as to prevent the weight to be driven.

12. The power tool as defined in claim 8, further comprising an air vent that can communicate the air spring chamber with the outside, wherein the air vent is closed when the cylinder moves to the second position and the air vent is opened when the cylinder moves to the
10 first position.

13. A power tool, comprising:

a tool bit,

an actuating mechanism that drives the tool bit linearly by means of pressure
15 fluctuations so as to cause the tool bit to perform a predetermined operation,

a dynamic vibration reducer having a weight that reciprocates under a biasing force of an elastic element to reduce vibration of the actuating mechanism and

means to drive the weight by means of pressure fluctuations caused in the actuating mechanism.
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14. A power tool comprising:

a driving motor,

a tool bit,

a tool holder that holds the tool bit within the power tool,

25 a striker that reciprocates in the axial direction of the tool bit so as to cause the tool bit to

perform a predetermined operation,

a cylinder that houses the striker such that the striker can slidingly reciprocate within the cylinder,

a crank chamber,

5 an actuating mechanism that is disposed within the crank chamber and drives the striker by converting a rotating output of the driving motor to linear motion, and

a dynamic vibration reducer that reduces vibration during the operation of the power tool, the dynamic vibration reducer having a weight and a body that houses the weight, wherein the weight can reciprocate under a biasing force of an elastic element,

10 means to drive the weight in the direction opposite to the reciprocating direction of the striker by introducing the fluctuating pressure caused within the crank chamber when driving the actuating mechanism into the body of the dynamic vibration reducer,

wherein the cylinder can move between a first position near the tool holder and a second position remote from tool holder than the first position, and under loaded driving conditions in
15 which a load associated with the predetermined operation is applied to the tool bit, the cylinder moves to the second position so as to allow the weight to be driven by means of fluctuating pressure within the crank chamber, while, under unloaded driving conditions in which a load associated with the predetermined operation is not applied to the tool bit, the cylinder moves to the first position so as to prevent the weight from being driven by means of fluctuating pressure within
20 the crank chamber.